Application No: 10/046,633
Attorney's Docket No: NL 010037

## CLAIM AMENDMENTS

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims**

1. (Currently Amended) A transmission system for transmitting a multilevel signal from a transmitter to a receiver, the transmitter comprising a mapper for mapping an input signal according to a variable signal constellation onto the multilevel signal, the receiver comprising a demapper for demapping the received multilevel signal according to the variable signal constellation, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

2. (Previously Presented) The transmission system according to claim 1, wherein $D_a$ has a maximum value.

3. (Cancelled)

4. (Currently Amended) The transmission system according to claim 1, wherein the signal

constellation is a 16-~~QAM~~Quadrature Amplitude Modulation signal constellation.

5. (Currently Amended) The transmission system according to claim 1, wherein the signal constellation is a 64-~~QAM~~Quadrature Amplitude Modulation signal constellation.

6. (Currently Amended) The transmission system according to claim 1, wherein the signal constellation is a 256-~~QAM~~Quadrature Amplitude Modulation signal constellation.

7. (Currently Amended) The transmission system according to claim 1, wherein the signal constellation is a 8-~~PSK~~ Phase Shift Keying signal constellation.

8. (Currently Amended) A transmitter for transmitting a multilevel signal, the transmitter comprising a mapper for mapping an input signal according to a variable signal constellation onto the multilevel signal, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

9. (Previously Presented) The transmitter according to claim 8, wherein $D_a$ has a maximum value.

10. (Cancelled)

11. (Currently Amended) A receiver for receiving a multilevel signal, the receiver comprising a demapper for demapping the multilevel signal according to a variable signal constellation, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

12. (Previously Presented) The receiver according to claim 11, wherein $D_a$ has a maximum value.

13. (Cancelled).

14. (Currently Amended) A mapper for mapping an input signal according to a variable signal

constellation onto a multilevel signal, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

15. (Previously Presented) The mapper according to claim 14, wherein $D_a$ has a maximum value.

16. (Cancelled).

17. (Currently Amended) A demapper for demapping a multilevel signal according to a variable signal constellation, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

18. (Previously Presented) The demapper according to claim 17, wherein $D_a$ has a maximum value.

19. (Cancelled).

20. (Currently Amended) A method of transmitting a multilevel signal from a transmitter to a receiver, the method comprising the steps of: mapping an input signal according to a variable signal constellation onto the multilevel signal, transmitting the multilevel signal, receiving the multilevel signal and demapping the multilevel signal according to the variable signal constellation, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

21. (Previously Presented) The method according to claim 20, wherein $D_a$ has a maximum value.

22. (Cancelled)

23. (Currently Amended) A multilevel signal, the multilevel signal being the result of a mapping of an input signal according to a variable signal constellation, wherein the variable signal constellation comprises $2^m$ signal points with corresponding labels of m bits in length, and satisfies the criteria:

$D_a > D_f$, with $D_a$ being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with $D_f$ being the minimum of the Euclidean distances between all pairs of signal points, and

the average Hamming distance ($H_1$) between all pairs of labels corresponding to neighboring signal points has a ~~substantially~~ minimum value.

24. (Previously Presented) The multilevel signal according to claim 23, wherein $D_a$ has a maximum value.

25. (Cancelled).

26. (Currently Amended) The multilevel signal according to claim 23, wherein the signal constellation is a 16-~~QAM~~Quadrature Amplitude Modulation signal constellation.

27. (Currently Amended) The multilevel signal according to claim 23, wherein the signal constellation is a 64-~~QAM~~Quadrature Amplitude Modulation signal constellation.

28. (Currently Amended) The multilevel signal according to claim 23, wherein the signal constellation is a 256-~~QAM~~Quadrature Amplitude Modulation signal constellation.

29. (Currently Amended) The multilevel signal according to claim 23, wherein the signal constellation is a 8-~~PSK~~Phase Shift Keying signal constellation.